USDA Sustainable Buildings

Sustainable Development Council

June 2010

This presentation is about…

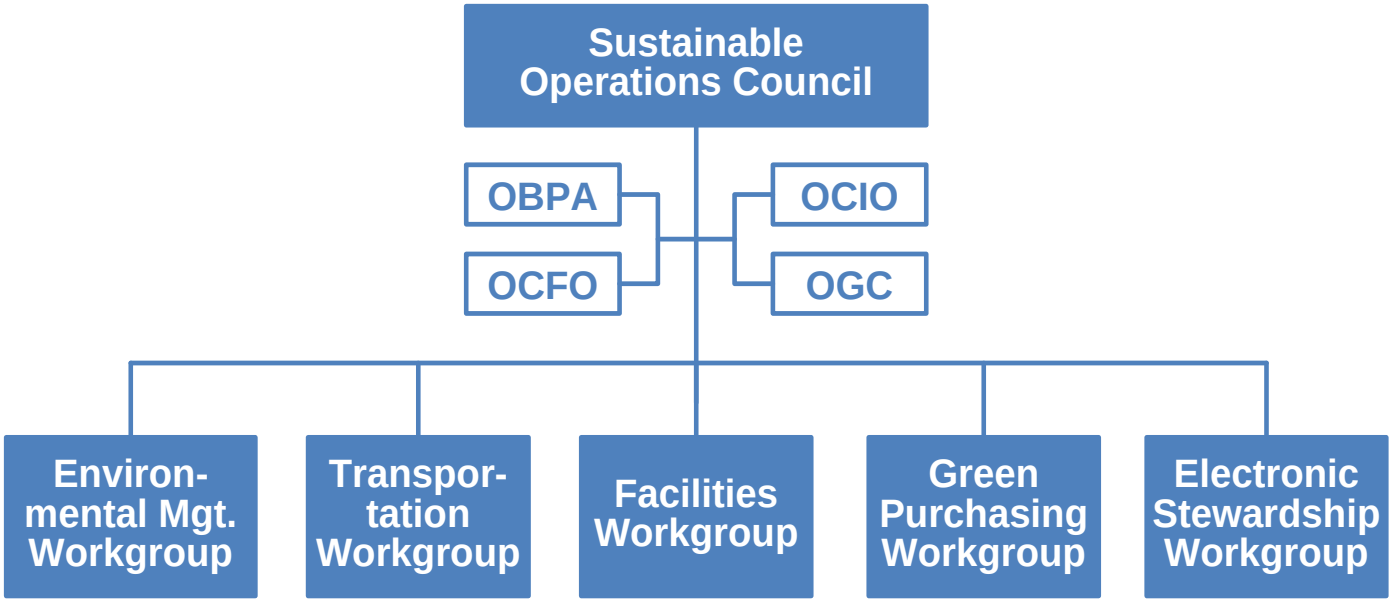
1. USDA Environmental Management Division and the Sustainable Operations Council

2. What are Sustainable Buildings?
3. Why measure Sustainability?

4. What is USDA's commitment?
5. What are the Benefits?
6. What makes a Building Sustainable?
7. USDA's Building Performance Metric
8. Assessment Criteria, and Assessment Process
9. Next Steps

USDA Strategic Sustainability Performance Plan

Figure 2
USDA Sustainable Operations Council Structure



Why measure sustainability?

- Validate environmental stewardship
- Executive Orders establish aggressive goals – EO 13514: "Federal Leadership in Environmental, Energy, and Economic Performance," EO 13423: "Strengthening Federal Environmental, Energy, and Transportation Management," EO13327, "Federal Real Property Asset Management," and
- Federal Real Property Profile (FRPP) data element 25

Other regulations

- 2007 Energy Independence and Security Act,
- 2005 Energy Policy Act
- Agency policies for sustainable buildings, and
- Measures for energy- and water-conservation, energy- and water-efficiency, environmentally preferred and biopreferred products

What is USDA's portfolio?

- stewardship over a 57.5 million gross square foot building footprint;
- 36.9 million square feet within 2,743 buildings over 5,000 gross square feet.
- responsible to apply sustainable strategies to all new buildings, major and minor renovations, and
- analyze, assess, and report on existing facilities 5,000 gross square feet and over.

What is USDA's Sustainable Building commitment?

Program, plan, design and build using integrated design principles for positive environmental attributes; and

Operate and maintain buildings with increasing measures of energy performance, water conservation, indoor environmental quality, and use of sustainable materials and systems.

Benefits

High-performance Sustainable Buildings provide -

…tangible benefits to the environment

…facilities that meet mission, safeguard occupants

…beneficial indoor environments;

…information and education as showcases, and

… market transformation.

What makes a Building Sustainable?

Follow the Federal Government's five guiding principles

the USDA Forest Service Bessey Ranger District Office, Nebraska National Forest, Rocky Mountain Region, Colorado R-2; andInyo Lone Pine Visitors Center,R-5

Certify with the USGBC's Leadership in Energy and Environmental Design (LEED®) system

the U.S. Environmental Protection Agency (EPA) Region 8 Headquarters in Denver, Colorado Photo credit: Robert Canfield

USDA's Building Performance Metric

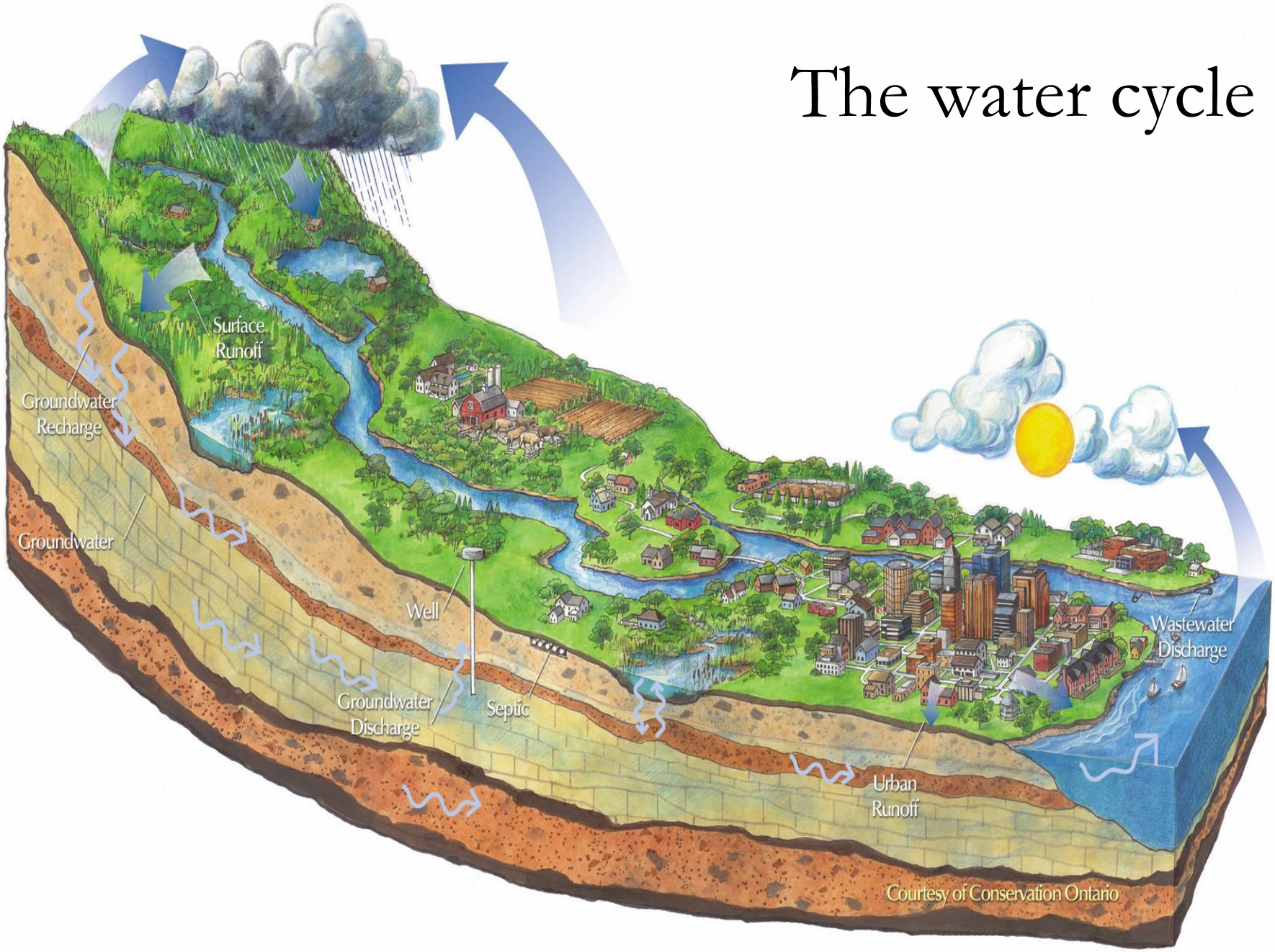
USDA Agency Building Sustainability Ranking Criteria	
category	sub-categories and points
Optimize Energy Performance	Four sub-categories,
	up to 25 points
Water Management & Conservation Measures	Four sub-categories,
	up to 22 points
Sustainable Sites	Four sub-categories,
	up to 20 points
Solid Waste Management	One sub-category,
	up to 5 Points
Materials Selection and Natural Resources Conservation	Four sub-categories,
	up to 15 Points
Indoor Environmental Quality	Six sub-categories,
	up to 10 Points

Lee Ranger District Office, George Washington-Jefferson NF, Southern Region
HVAC geothermal heat pump

Optimize Energy Performance

Optimize Energy Performance		points
Energy Efficiency and Energy Management	Use one of the following four options to measure energy efficiency performance:	
	Use a Energy Management, Waste Reduction, and Recycling plan.	8
	Receive an ENERGY STAR® rating of 75 or higher or an equivalent Labs21 Benchmarking Tool score for laboratory buildings.	5
	Reduce energy use by 20% compared to building energy use in 2003 or a year thereafter with quality energy use data.	5
	Practice energy conservation measures that enable the building to gain at least 30% in energy efficiency relative to ASHRAE 90.1-2004.	8
Energy Efficient Products	Use ENERGY STAR® and FEMP-designated Energy Efficient Products, where available - estimate percentage use of available products:1 point for 30%, 2 points 60%, 3 points 90% or more.	3
Renewable Energy	Implement renewable energy generation projects on agency property for agency use, when lifecycle cost effective, or purchase Renewable Energy Credits – 2 points for 10%, 4 points for 30%, 6 points for 50%, 7 points for 70%, 8 points for 90% or more total energy use	8
Measurement and Verification	Per FSH 7309-11, Chapter 70 (sec. 71.2, ex. 01), utilize advanced energy metering for buildings over 10,000 SF or annual electric bill over $40,000. Include natural gas and steam.	6

The water cycle



Water Management & Conservation Measures

Water Management & Conservation Measures		points
Indoor Water	Reduce building measured potable water use by 20% compared to 2003/year thereafter building water use / a water baseline for the building.	3
Outdoor Water	Use one option to measure potable water use performance:	
	Reduce potable irrigation water use by 50% compared to conventional methods, or	3
	Reduce building related potable irrigation water use by 50% compared to measured irrigation water use in 2003 or a year thereafter with quality water data, or	4
	Use no potable irrigation water.	5
Measurement of Water Use	Install a water meter for the building or reduce the potable water use (indoor and outdoor combined) by at least 20% compared to building water use in 2003 or a year thereafter.	4
Water Efficient Products	Use EPA's WaterSense-labeled products or other water conserving products, and choose iWaterSense-certified rrigation contractors;estimate percentage use of available products: 1 point for 30%, 2 points 60%, 3 points 90% or more..	3

Sustainable Sites

Sustainable Sites		points
Low Impact Development	Re-forest and introduce plants:	
	In rural and suburban settings, conserve forest and wilderness areas.	4
	In urban settings, use existing buildings and infill sites, and plant trees.	4
Site operations and maintenance	Reduce use fertilization, de-icing, pest control chemicals, at least 50%	1
	Preferred parking is reserved for carpool and/or alternate fuel vehicle parking (5% of total spaces).	1
	Native plant species are used for landscaping; permanent landscape irrigation systems are eliminated or utilize only collected rainwater (no potable water).	2
Site hydrology and runoff water	Natural site hydrology (drainage patterns, natural streams, infiltration, etc.) is maintained or restored	4
	OR utilize one or both strategies:	
	Rain gardens, pervious pavement, rainwater recycling, settling ponds, etc. are utilized to reduce site runoff.	2
	Permeable and porous pavements, bio-swales, vegetated buffers and islands, and infiltration areas are utilized to reduce or treat pollutants from runoff on site.	2

Sustainable Sites (cont'd)

Sustainable Sites		points
Building technologies and practices	The building employs vegetative and landscape strategies to reduce building heat island contribution and reduce storm-water runoff /storm sewer use from roof. Examples: green roofs and living walls, rain gardens, downspout absorption beds - estimate percentage reduction of heat gain and runoff: 1 point for 20%, 2 points 40%, 3 points 60%, 4 points 80% or more.	up to 4
	The building takes advantage of natural light, prevailing winds and other site conditions, exterior plantings or façade treatments for shading, natural lighting via windows or skylights, earth sheltering, building orientation, sun angle, and other natural features for energy efficiency - estimate percentage reduction of energy use: 1 point for 20%, 2 points 40%, 3 points 60%, 4 points 80% or more.	up to 4

Solid Waste Management

Solid Waste Management		points
Waste and Materials Management	Use a Solid Waste Management, Waste Reduction, and Recycling plan.	5
	OR utilize one of the following strategies:	
	Manage trash collection and handling so as to recycle a minimum of 25% of solid waste	2
	Manage trash collection and handling so as to recycle a minimum of 50% of solid waste	3
	Manage trash collection and handling so as to recycle a minimum of 75% of solid waste	4
	Manage trash collection and handling so as to recycle a minimum of 90% of solid waste	5

Material and Natural Resources Conservation

Materials Selection and Natural Resources Conservation -- building modifications, maintenance, and cleaning--		**points**
recycled content	Where such products meet performance requirements and are available at a reasonable cost, use products that meet or exceed EPA's recycled content recommendations or are EPA certified - estimate percentage use of available products: 1 point for 30%, 2 points 60%, 3 points 90% or more.	3
biobased content	Use products with the highest biobased content level per USDA's biobased content recommendations, made from rapidly renewable resources and certified sustainable wood products - estimate percentage use of available products: 1 point for 20%, 2 points 40%, 3 points 60%, 4 points 80% or more.	4
Environmentally Preferable products	Use products that have a lesser or reduced effect on human health and the environment over their lifecycle when compared with competing products or services that serve the same purpose- estimate percentage use of available products: 1 point for 20%, 2 points 40%, 3 points 60%, 4 points 80% or more..	4
ozone depleting compounds	Eliminate the use of ozone depleting compounds where alternative environmentally preferable products are	4

Indoor Environmental Quality

Indoor Environmental Quality (IEQ)		points
Ventilation and Thermal Comfort	Meet ASHRAE Standard 55-2004 Thermal Environmental Conditions for Human Occupancy and ASHRAE Standard 62.1-2007: Ventilation for Acceptable Indoor Air Quality.	2
Moisture Control	Building utilizes appropriate moisture control strategy for the climate, to prevent building damage, minimize mold contamination, and reduce health risks related to moisture. For façade renovations, Dew Point analysis and a plan for cleanup or infiltration of moisture into building materials are required.	1
Daylighting and Lighting Controls	Provide automated lighting controls (occupancy/vacancy sensors with manual-off capability) for offices and intermittently occupies rooms.	1

Indoor Environmental Quality (cont'd)

Indoor Environmental Quality (IEQ)		points
Daylighting and Lighting Controls (cont'd)	Achieve a minimum daylight factor of 2 percent (excluding all direct sunlight penetration) in 50 percent of all space occupied for critical visual tasks, or	1
	Provide occupant controlled lighting, allowing adjustments to suit individual task needs, for 50 percent of regularly occupied spaces.	1
Low-Emitting Materials	Use low emitting materials for building modifications, maintenance, and cleaning.	1
Integrated Pest Management	Use integrated pest management techniques as appropriate to minimize pesticide usage. Use EPA-registered pesticides only when needed.	2
Tobacco Smoke Control	Prohibit smoking within the building and within 25 feet of all building entrances, operable windows, and building ventilation intakes.	1

Sustainable Buildings Workbook

Sustainable Building Workbook for Forest Service

Asset Name	Gross Sq. Ft.	Owned, Leased, Other	Energy Performance				Water Management & Conservation Measures				Sustainable Site Strategies				Solid Waste Management	Materials Selection and Natural Resources Conservation				Indoor Environmental Quality						Scoring		
			Energy Management (8 points possible)	Energy Efficient Products (3 point possible)	Onsite Renewable Energy (8 points possible)	Measurement & Verificaton (6 points possible)	Indoor Water (3 points possible)	Outdoor Water (3 to 5 points - see points document)	Measurement of Water Use (4 points possible)	Water Efficient Products (3 points possible)	Low Impact Development (4 points possible)	Site Operations and Maintenance (4 points possible)	Site Hydrology and Runoff Water (4 points possible)	Building Technologies & Practices (8 points possible)	Waste and Materials Management (5 points possible)	Recycled Content (3 points possible)	Biobased Content (4 points possible)	Environmentally Preferable Products (4 points possible)	Ozone Depleting Compounds (4 points possible)	Ventilation & Thermal Comfort (2 points possible)	Moisture Control (1 point possible)	Daylighting & Lighting Controls (3 points possible)	Low Emitting Materials (1 point possible)	Integrated Pest Management (2 points possible)	Tobacco Smoke Controls (1 point possible)	Total points	100% Scale	Sustainable (over 65%) Y or N
FB-PO-CT	98205	GSA ASSIGNED	5	1	0	0	3	3	4	3				2	5	3	2	2	4	2	1	1	1	1	1	44	49	Y
FORT MISSOULA BLDG 24	46332	USDA OWNED	0	2	0	0	0	0	0	1	0	0	0	0	2	1	1	1	4	2	1	2	1	0	1	19	21	N
FORT MISSOULA BLDG 46	7500	USDA OWNED	0	2	0	0	0	0	0	1	0	0	0	0	2	1	1	1	4	2	1	2	1	0	1	19	21	N
PLAINS MAIN OFFICE	7996	USDA OWNED	0	2	0	0	0	0	0	1	0	0	0	0	2	1	1	1	4	2	1	2	1	0	1	19	21	N
06 DISTRICT OFFICE	6675	USDA OWNED	0	2	0	0	0	4	0	1	0	0	0	0	2	1	1	1	4	2	1	2	1	0	1	23	26	N
SUPERIOR RD OFFICE	10150	USDA LEASED	0	2	0	0	0	0	0	1	0	0	0	0	2	1	1	1	4	2	1	2	1	0	1	19	21	N
ST. REGIS WC OFFICE	6496	USDA OWNED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1.1	N
LOFT	26494	USDA OWNED	8	2	1		0	3			4	2	1	1	5	2	1	2	4	2	1	1	1	2	1	44	49	Y
NORTHERN ROCKIES COORDINATION CENTER	6960	USDA OWNED	8	2	1		0	3			4	2	1	1	5	2	1	2	4	2	1	1	1	2	1	44	49	Y
OFFICE, NEW SUPERVISOR'S HQ	2704	USDA OWNED		3				3		4	2	4		4	2	3	3		4	2	1	2	1	2	1	41	46	Y
BEARLODGE RD	5231	USDA LEASED		3							4		4	1	3	3			4	2	1	1	1	2	1	30	33	N
HELLS CANYON RD	7296	USDA LEASED		3							4		4	1	3	3			4	2	1	1	1	2	1	30	33	N
OFFICE, CUSTER RD	6189	USDA OWNED		3							4		4	1	3	3			4	2	1	1	1	2	1	30	33	N
OFFICE, MYSTIC RD	27438	USDA OWNED		3		6			4		4		4	2	3	3	1	4		2	1	2	1	2	1	43	48	Y
NORTHERN HILLS RD (SPEARFISH)	11988	USDA LEASED		3							4		4	1	3	3			4	2	1	1	1	2	1	30	33	N
CARSON SUPERVISOR'S OFFICE	14640	USDA LEASED	8	3	2	1	2	4	4	2	4	3	4	4	4	1	1	2	2	1	1	3	1	2	1	60	67	Y
JICARILLA RD OFFICE	8767	USDA LEASED	8	3	2	1	2	4	3	2	4	3	4	4	3	1	1	2	2	1	1	3	1	2	1	58	64	Y
OFFICE	5460	USDA OWNED	8	3	2	1	2	5	3	2	4	3	4	4	3	1	1	2	2	2	1	3	1	2	1	60	67	Y
NEW QUESTA OFFICE	7897	USDA OWNED	8	3	2	1	3	4	4	3	4	3	4	4	3	1	1	2	2	2	1	3	1	2	1	62	69	Y
FORT WINGATE MAIN OFFICE/ SHEEP LAB	5268	USDA OWNED	5	1	0	0	3	3	4	0	4	1	0	0	2	0	0	2	0	0	1	1	1	0	1	29	32	N
SANDIA DISTRICT OFFICE	9280	USDA OWNED	5	2	0	0	3	4	4	3	4	2	2	2	3	1	1	2	0	0	1	2	1	2	1	45	50	Y
LINCOLN NF SO	19900	USDA LEASED	8	2	7	6	3	3	4	1	4	0	1	0	2	1	0	0	0	2	0	0	0	0	0	44	49	Y
~~LINCOLN SO BLDG~~	~~11682~~	~~USDA OWNED~~	THIS BUILDING IS NO LONGER LEASED TO THE FOREST SEVICE- IT WAS REPLACED BY ASSET L030812																							0	0	N/A
SBRD OFFICE	5180	USDA OWNED	0	1	0	0	0	0	0	0	4	0	0	0	2	1	0	0	0	0	1	0	0	0	0	9	10	N
SACRAMENTO ADMINISTRATIVE OFFICE	9980	USDA OWNED	8	2	0	0	3	3	4	2	2	1	4	0	2	3	0	4	2	2	1	2	0	0	0	45	50	Y
~~SRD OFFICE~~	~~5015~~	~~USDA OWNED~~	THIS BUILDING IS NO LONGER LEASED TO THE FOREST SEVICE- IT WAS REPLACED BY ASSET 21601																							0	0	N/A
RAN MAIN OFFICE	8964	USDA OWNED	3	1	0	0	1	3	1	0	1	2	0	0	2	0	1	1	0	1	0	1	0	0	1	19	21	N
MTDC OFFICE	6671	USDA OWNED	5	2	4	6	3	3	4	0	4	1	2	2	2	1	1	4	4	2	1	3	1	1	1	57	63	Y

Next Steps

- Continue to measure and validate building sustainability;
- Further refine assessment system, sustainable measures, criteria, characteristics, and point distribution;
- Share information on practices, via web-based tools, including the USDA 'Greening' website;
- Continue to define performance metrics, and set departmental standards; and
- Assess each asset; does it meet high-performance criteria and standards?

for more information, contact

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